

REMARKS

Applicants have amended claims 1, 3 and 4.

Claim Objections

The Examiner objected to an extra colon in claim 1. Applicants have amended claim 1 accordingly.

112 Rejections

The Examiner has objected to lack of antecedent basis in claim 1, specifically “the interior wall” and “the silicon holding vessel.” Applicants have amended the claim to read, “an interior wall” and a “vessel,” respectively.

The Examiner objects to claim 3 as indefinite and argues the claim does not differentiate between the coating and the vessel. Applicants have amended the claim to recite “the vessel” and direct the Examiner to paragraphs 15 and 17, which describe the vessel as “comprising silicon oxide, boron nitride and/or graphite.”

Applicants believe, in light of the amendments, the objections are now moot.

103 Rejection

Claims 1-9 and presumably claim 10 are rejected as obvious over Hide and US 4,755,220 to Wooditsch. Claims 1 and 6 are the only independent claims. All dependent claims stand or fall with their independent claim. Applicants believe (I) the references may not be combined as suggested by the Examiner and (II) even if combined the references would not teach the claimed subject matter.

Hide teaches a coating comprising silicon dioxide and silicon nitride, but the Examiner admits that Hide does not suggest elemental silicon as a part of the coating.

Wooditsch teaches a crucible comprising silicon metal, silicon nitride, and silicon dioxide.

The present invention relates to a coating for use in vessels that hold high purity silicon. See, e.g., paragraph 21. The coating uses 20-50wt.% silicon metal as a binder for silicon nitride. As explained in the specification, silicon nitride by itself does not sinter well. The prior art relied on heating at high pressure, that is, hot isostatic pressing (HIP), to effect sintering. The amount of silicon metal binder in the present invention is critical. Too little prevents the silicon metal from functioning as a binder. Too much permits the ultrapure silicon metal that is being held in the vessel to diffuse into the coating, thereby contaminating the silicon metal in the vessel. See paragraph 24.

A prima facie case of obviousness exists only when the Examiner provides:

1. one or more references;
2. that were available to the inventor;
3. that teach;
4. a suggestion to combine or modify the references;
5. the combination or modification of which would appear sufficient to have made the claimed invention obvious to one of ordinary skill in the art.

I. Applicants believe the references cannot be combined to obviate the invention. Hide does not teach, suggest or even mention the use of silicon metal. Indeed, silicon metal is not needed in Hide because the coating is baked at elevated temperatures. Woditsch explicitly states (a) silicon dioxide is the binder (col. 4, lines 54-55); (b) the presence of silicon metal is not critical (col. 4, lines 3-5); and (c) the range of silicon metal is typically 2-20 wt.% (col. 2, lines 54-55).

A suggestion to combine may come from the references themselves or from the nature of the problem to be solved. "It is impermissible to use the claimed invention as

an instruction manual or ‘template’ to piece together the teachings of the prior art.” In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). An examiner may not use the application as a template for producing the claimed invention using elements from the prior art.

Here, Hide describes a coating comprising silicon nitride and silicon dioxide. Hide contains no silicon metal. Woditsch claims a material for use as a crucible. The material includes silicon metal, preferably at levels below that required by the present invention. The Examiner has combined a coating material with a crucible material. The Examiner must “identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. See, *KSR Int’l. Co. v. Teleflex, Inc.*, 550 US ____ (2007), slip op. at 14. Applicants submit the claims were not within the grasp of a person of ordinary skill in the relevant art nor has the Examiner identified a reason for their particular combination. Failing to show some reason for their combination, the cited references cannot render obvious the present invention.

II. Assuming the combination of references is proper, Hide and Woditsch do not teach the claimed invention. Woditsch teaches the use of a binder comprising a silicon dioxide suspension. The suspension is gelled and then nitrified to form silicon nitride and silicon oxynitride. Silicon metal is not a binder in Woditsch, and Woditsch does not describe a composition with more than 20 wt.% silicon metal. In contrast, the present invention describes a binder of at least 20 wt.% silicon metal. This composition produces a thermet, that is a thermally treated ceramic/metal composite, where silicon metal is the binder for silicon nitride ceramic. Applicants believe the combined references cannot

obviate the present invention because, neither reference is a thermite or utilizes silicon metal as a binder.

For the above reasons, Applicants request cancellation of the 103 rejection.

Applicants submit pending claims 1-10 are allowable and the application is in condition for allowance. Early and favorable action is earnestly solicited.

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Respectfully submitted,

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